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Three new species of the genus *Macrostylis* G.O. Sars, 1864 (Crustacea: Isopoda: Macrostylidae) from the Indian Ocean

Три новых вида рода *Macrostylis* G.O. Sars, 1864 из Индийского океана (Crustacea: Isopoda: Macrostylidae)

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КЛЮЧЕВЫЕ СЛОВА: Isopoda, *Macrostylis*, новые виды, абиссаль, Индийский океан.

ABSTRACT. Three species of the genus *Macrostylis* G.O. Sars, 1864, new for science, are described from the abyssal zone of the Indian Ocean. *M. expolita* sp.n. (14°33´–16°09.3´N, 56°54´–92°37.1´E; 2478–2519 m) differs from the related *M. foveata* Mezhov, 2000 by strong setation of the body, the number and shape of the excavations on the tergites, the posterolateral processes of tergite IV, the shape of the pleotelson, the presence of three spines and a hook-like frontal spine on the sternal surface of the pereon's anterior division, the shape and setation of operculum. *M. latiuscula* sp.n. (26°19.5´S, 89°59.5´E; 4730–4808 m) differs from other representatives of the genus by the following combination of characters: the comparatively wide body, the shortened pleotelson, the presence of the original tubercles on the sternal surface of the pereonal anterior division, the short antennae II, the rather poorly advanced pereopod III and the elliptical operculum. *M. lacunosa* sp.n. (2°03.2´S, 86°44´E; 4706–4737 m) differs from other species of the genus by the combination of the narrow, oblong body and pits on the head, the tergites and pleotelson without any setation, the single sternal spine, the short antenna II, the elongated narrow tooth process of the mandible, the broadened fourth article of the maxillipedal palp and the short, wide operculum.

РЕЗЮМЕ: Три вида рода *Macrostylis* G.O. Sars, 1864, новые для науки, описаны из абиссали Индийского океана. *Macrostylis expolita* sp.n. (14°33´–16°09,3´с.ш., 56°54´–92°37,1´в.д.; 2478–2519 м) отличается от близкого *M. foveata* Mezhov, 2000 отчетливо выраженным щетинковым покровом тела, количеством и расположением выемок на тергитах, постеролатеральными выростами тергита IV, формой плеотельсона, наличием трех шипов и крючковидным фронтальным шипом на стернальной поверхности переднего отдела переона, формой и щетинковым вооружением оперкулюма. *M. latiuscula* sp.n. (26°19,5´ю.ш., 89°59,5´в.д.; 4730-4808 м) отличается от других представителей рода следующим сочетанием признаков: сравнительно широкое тело, укороченный плеотельсон, наличие своеобразных бугорков на стернальной поверхности переднего отдела переона, маленькие антенны II, очень слабо развитый переопод III и эллиптический оперкулюм. *M. lacunosa* sp.n. (2°03,2´ю.ш., 86°44´в.д.; 4706–4737 м) отличается от остальных видов рода сочетанием узкопродолговатого тела и ямок на голове, тергитах и плеотельсоне с отсутствием щетинкового покрытия, единственным стернальным шипом, короткой антенной II, удлиненным узким зубным отростком мандибулы, расширенным четвертым члеником щупика ногочелюсти и коротким широким оперкулюмом.

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Three new species from the genus *Macrostylis* G.O. Sars, 1864 are found in the R/V "Vityaz" abyssal collections (voyages 31 and 33, from the northwestern and central parts of the Indian Ocean). They are described herein. The station data of the material are shown in Table 1. Type specimens are deposited in the Zoological Museum of the Moscow State University.

Table 1. Collecting stations.
Таблица 1. Станции сбора материала.

No. of station	Gear	Coordinates		Depth, m
		Latitude	Longitude	
4577	ST	26°19,5'S	89°59,5'E	4730–4808
4594	ST	2°03,2'S	86°44'E	4706–4737
4724	BS	14°33'N	56°54'E	2478
4963	BS	16°09,3'N	92°37,1'E	2519

Gears: BS — bottom sampler "Okean", ST — Sigsby Trawl.

Macrostylis expolita **sp.n.**
Tab. 1, Fig. 1.

MATERIAL. Holotype ♀ without oostegites, 2.7 mm long, # Mc-1366, station 4724. Paratypes: ♀, with empty marsupium, 2.4 mm long and ♀, without oostegites, 2.8 mm long, # Mc-1367, station 4724; ♀, without oostegites, 2.5 mm long, # Mc-1368, station 4963.

DESCRIPTION. Female, 2.7 mm long, holotype. Maximal width of body 4.2 times less than length and 1.5 times more than maximal width of pleotelson. Cuticle smooth, glossy; macrosculpture with orbicular pits of different sizes on dorsal surfaces of tergites and pleotelson; setation consists of numerous short hair-like setae located dorsolaterally on head, tergites and pleotelson.

Head hemiorbicular, maximal width approximately 1.65 times more than length and 1.75 times more than width of frontal margin; medial part trapezoidal, with a little bit convex lateral surfaces; frontal margin direct.

Anterior division of pereon keg-like (especially its anterior third), length subequal to maximal width; tergite I approximately 1.2 times longer, than tergite II and 1.1 times shorter, than tergite III; sternal surface differentiated segmentally by deep transversal grooves and armed with three spines: anterior spine rather long and curved hook-likely, middle very short and directed downwards, posterior longer and directed inferocaudally.

Tergite IV broadened frontally, with convex lateral surfaces, length 3.7 times less than maximal width; posterolateral parts tapered, with short curved bristles on ends; sternite IV with short spine directed caudally.

Tergite V approximately equal in length to tergite VI and almost 1.2 times longer than tergite VII; posterolateral parts of tergites V–VII visible tapered caudally, with short curved distal bristle; sternites V–VII with short spines directed backwards.

Pleotelson elongated-ovoid, with swelled lateral parts, one fourth part of body length; maximal width 1.6 times less than length and 1.3 times more than width of distal part; posterolateral projections large and angular; mediodistal lobe large, subacute-angular; caudal organs visible distinctly, slot-like apertures transversal.

Antenna I consists of 5 articles, length ratios from basal to distal makes 1 : 0.65 : 0.45 : 0.30 : 0.20; distal article with one aesthetasc of average length. Antennas II not saved.

Mandible with serrated cutting margin (with at least 3 roundedly blunt teeths); movable plate with preapical longitudinal row consisting of 4 denticles; tooth row consists of not less than 9 sawtooth bristles; tooth process broad, conical in proximal half, whereas distal half tapered with at least 9 terminal bristles; simple bristle instead of palp. Epipodite of a maxillipede drop-shaped, without excavation on exterolateral margin; length 3 times more of maximal width.

Length of pereopod III ischiopodite 1.65 times more than maximal width; lobe small, widely rounded, with pair of long forked thickened apical bristles; combs of meropodite and carpopodite with 6 (5 long and one short distal) and 4 bristles accordingly. Ischiopodite of pereopod IV with low, widely angular lobe.

Operculum tongue-like, maximal width 1.5 times less than length and 4 times more than width of distal part; distal margin with 16 short pinnate bristles.

Uropods not saved.

TAXONOMIC REMARKS. The following characters show the systematic affinity of *M.expolita* sp.n. and *M. foveata* Mezhov, 2000: distinct orbicular excavations on tergites, structure of the first antennas, shape of the pereopod III ischiopodite and presence two long forked bristles on top of the lobe. The new species differs distinctly by the strong setation of a body, number and shape of excavations on the tergites, posterolateral processes of the tergite IV, shape of the pleotelson, presence of three spines and a hook-like frontal spine on a sternal surface of the anterior pereon and the shape and setation of the operculum.

ETYMOLOGY. From Latin *expolitus* (shining); refering to the glossiness of the cucticle.

DISTRIBUTION. Northern part of the Indian Ocean (14°33′–16°09.3′N, 56°54′–92°37.1′E).

ECOLOGY. Abyssal zone, depth 2478–2519 m; in foraminiferal clayey silt, bottom temperature 1.3–1.9°C; estimated density 5–15 ind/m^2 and biomass 0.005–0.015 g/m^2.

Macrostylis latiuscula **sp. n.**
Tab. 1, Fig. 2.

MATERIAL. Holotype ♀, without oostegites, 2.3 mm long, # Mc-1369, station 4577. Paratype ♀, without oostegites, 2.3 mm long, # Mc-1370, station 4577.

DESCRIPTION. Female, 2.3 mm long. Body relatively broadened, maximal width (tergite IV) 3.6 times less than length and 1.7 times more than maximal width of pleotelson; cuticle of body distinctly granulated, macrosculpture not present; setation consists of rather numerous short thin hairs on dorsolateral surfaces of tergites and pleotelson.

Head trapezoidal, with direct lateral surfaces and elongated posterolateral parts, maximal width almost 1.3 times more than length and 1.9 times more than width of distal margin; frontal margin weakly convex, almost direct.

Anterior division of pereon with rounded anterolateral parts, angular posterolateral parts and practically direct lateral surfaces; length 1.15 times less than maximal width; tergite I 1.1 times longer than tergite II and 1.15 times shorter than tergite III; sternal surface differentiated segmentally by deep transversal grooves, with three tubercles instead of spines.

Tergite IV very much poorly broadened frontally, maximal width 3.5 times more than length; lateral surfaces weakly convex; posterolateral processes distinct, with short distal bristles like of claws.

Tergite V 1.05 times longer than tergite VI and 1.1 times longer than tergite VII; posterolateral parts of tergites broadened, with short distal bristles like of claws; sternite V with tubercle instead of spine, sternites VI and VII with short spines.

Pleotelson ovoid, length 4,5 times less than total body length; maximal width 1.35 times less than length and 1.4 times more than distal width; dorsal surface uniformly convex; posterolateral projections small, mediodistal lobe of average size and widely rounded; caudal organs visible, slot-like apertures transversal.

Antenna I consists of 5 articles, length ratios from basal to distal: 1 : 0.75 : 0.55 : 0.35 : 0.15; distal article with single aesthetasc of average length. Antenna II short and thin, approximately 3.5 times longer than antenna I and reaching tergite III; flagellum consists of 7 articles; rudiment of exopodite one-articulated.

Mandible with serrated cutting margin (with at least 5 teeth); movable plate with 3–4 teeth; in tooth row not less than 8 bristles; tooth process large, with 8 terminal bristles on widely tapered distal part. Epipodite of maxillipede drop-shaped, length 3 times more than maximal width; exterodistal margin without excavation.

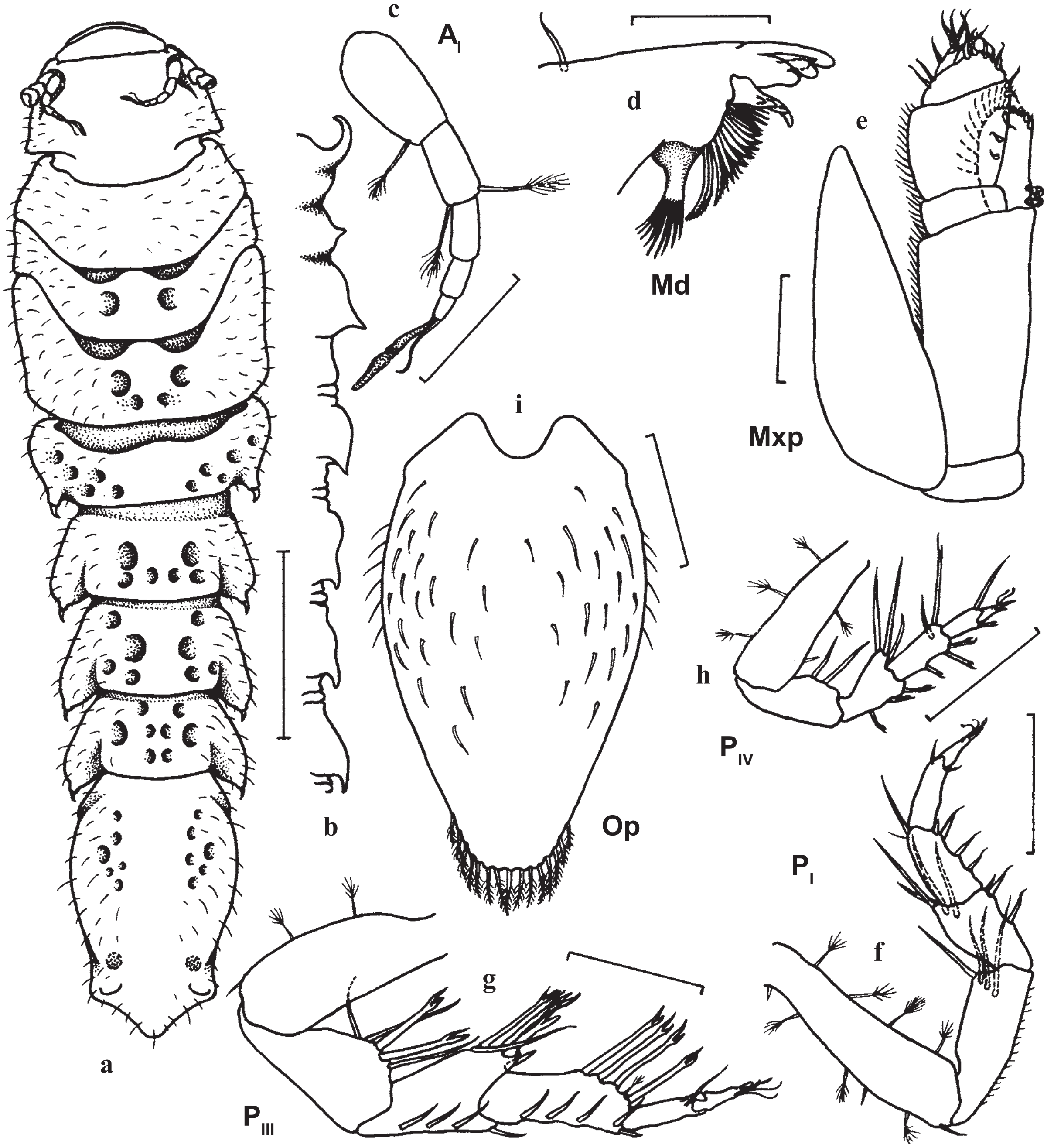


Fig. 1. *Macrostylis expolita* sp.n. Holotype female: total view from above (a), sternites from lateral side (b) and appendages (c–i). Scale bars: 0.5 mm (a, b), 0.05 mm (c–e) and 0.1 mm (f–i).

Рис. 1. *Macrostylis expolita* sp.n. Голотип самка: общий вид сверху (а), стерниты сбоку (b) и придатки (c–i). Масштаб 0,5 мм (a,b), 0,05 мм (c–e) и 0,1 мм (f–i).

Pereopod III is characterized as a whole by aberrantly small sizes; ischiopodite elongated, triangular, length 1.75 times more than maximal width; lobe short, widely angular, with one direct thickened bristle of average length on top; combs of meropodite and carpopodite with 4 and 3 bristles of average length accordingly. Ischiopodite of pereopod IV without lobe.

Operculum elliptic, maximal width 1.5 times less than length and 1.3 times more than width of distal part; distal margin widely rounded, with 16 relatively long pinnate bristles.

Saved parts of uropods are represented by fragments of protopodites.

TAXONOMIC REMARKS. Comparatively wide body, shortened pleotelson, presence of original tubercles on sternal surface of pereon anterior division, small antennas II, very much poorly developed pereopod III and an elliptic operculum — such combination of characters distinguishes *M. latiuscula* sp.n. from other representatives of the genus.

ETYMOLOGY. From Latin *latiusculus* (widish); refers to the body proportions.

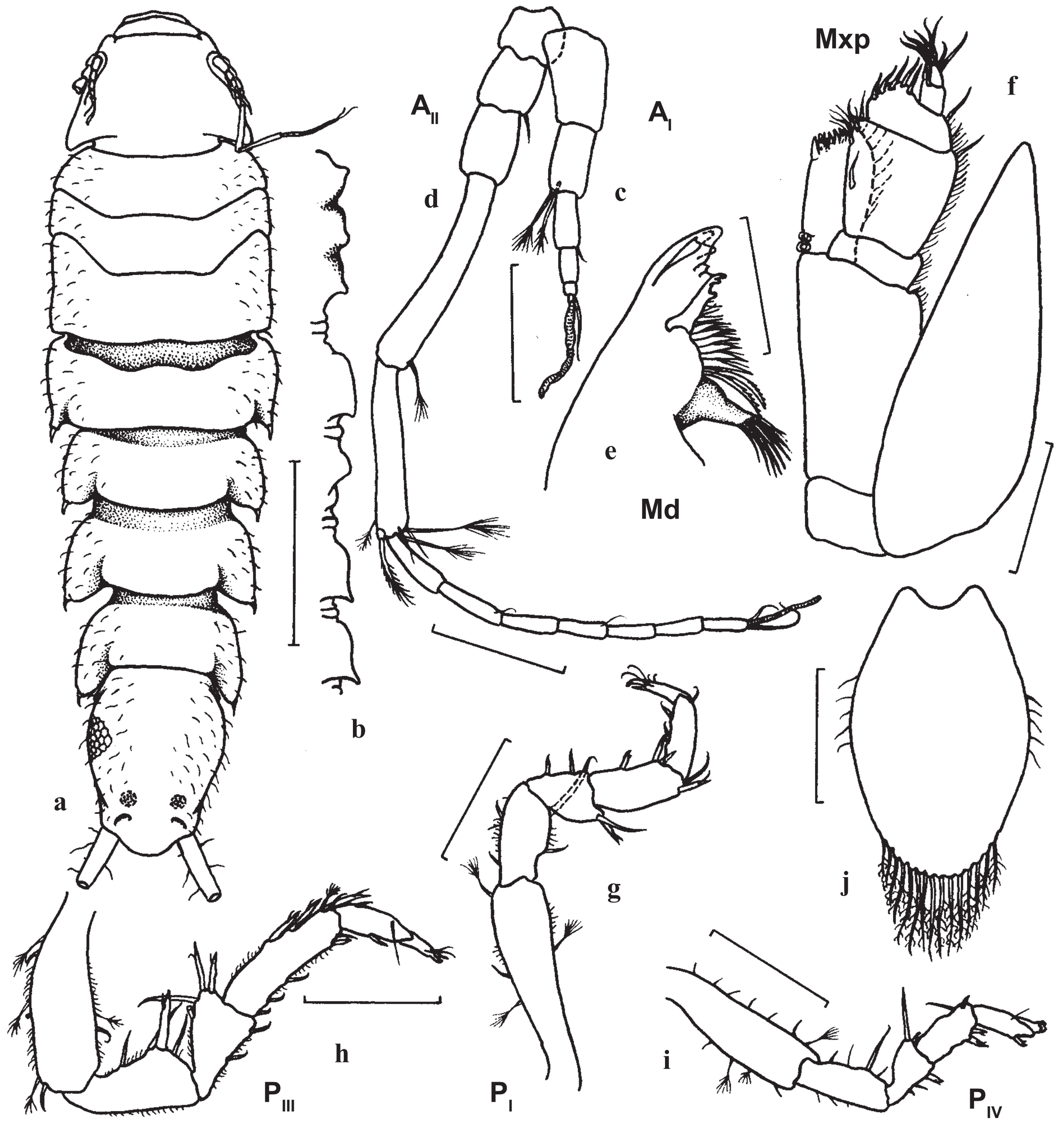


Fig. 2. *Macrostylis latiuscula* sp.n. Holotype female: total view from above (a), sternites from lateral side (b) and appendages (c–j). Scale bars: 0.5 mm (a, b), 0.05 mm (c–f) and 0.1 mm (g–j).

Рис. 2. *Macrostylis latiuscula* sp.n. Голотип самка: общий вид сверху (а), стерниты сбоку (b) и придатки (c–j). Масштаб 0,5 мм (a,b), 0,05 мм (c–f) и 0,1 мм (g–j).

DISTRIBUTION. Central part of the Indian Ocean (26° 19.5´S, 89°59.5´E).

ECOLOGY. Abyssal zone, depth 4730–4808 m; half-liquid clayey silt with a great number of concretions and teeth of sharks; bottom temperature 0.9°C.

Macrostylis lacunosa **sp.n.**
Tab. 1, Fig. 3.

MATERIAL. Holotype ♀, without oostegites, 2.0 mm long, # Mc-1371, station 4594.

DESCRIPTION. Female, 2.0 mm long. Body oblong, with almost parallel lateral sides, maximal width 5.6 times less than length and 1.25 times more than maximal width of pleotelson; cuticle smooth and glossy, with translucent granulosity; setation absent; dorsal surfaces of cervical girdle, tergites and pleotelson with small orbicular pits.

Head rounded-trapezoidal, maximal width approximately 1.55 times more than length and 1.6 times more than width of frontal margin; lateral surfaces insignificantly concave, almost direct; frontal margin poorly convex.

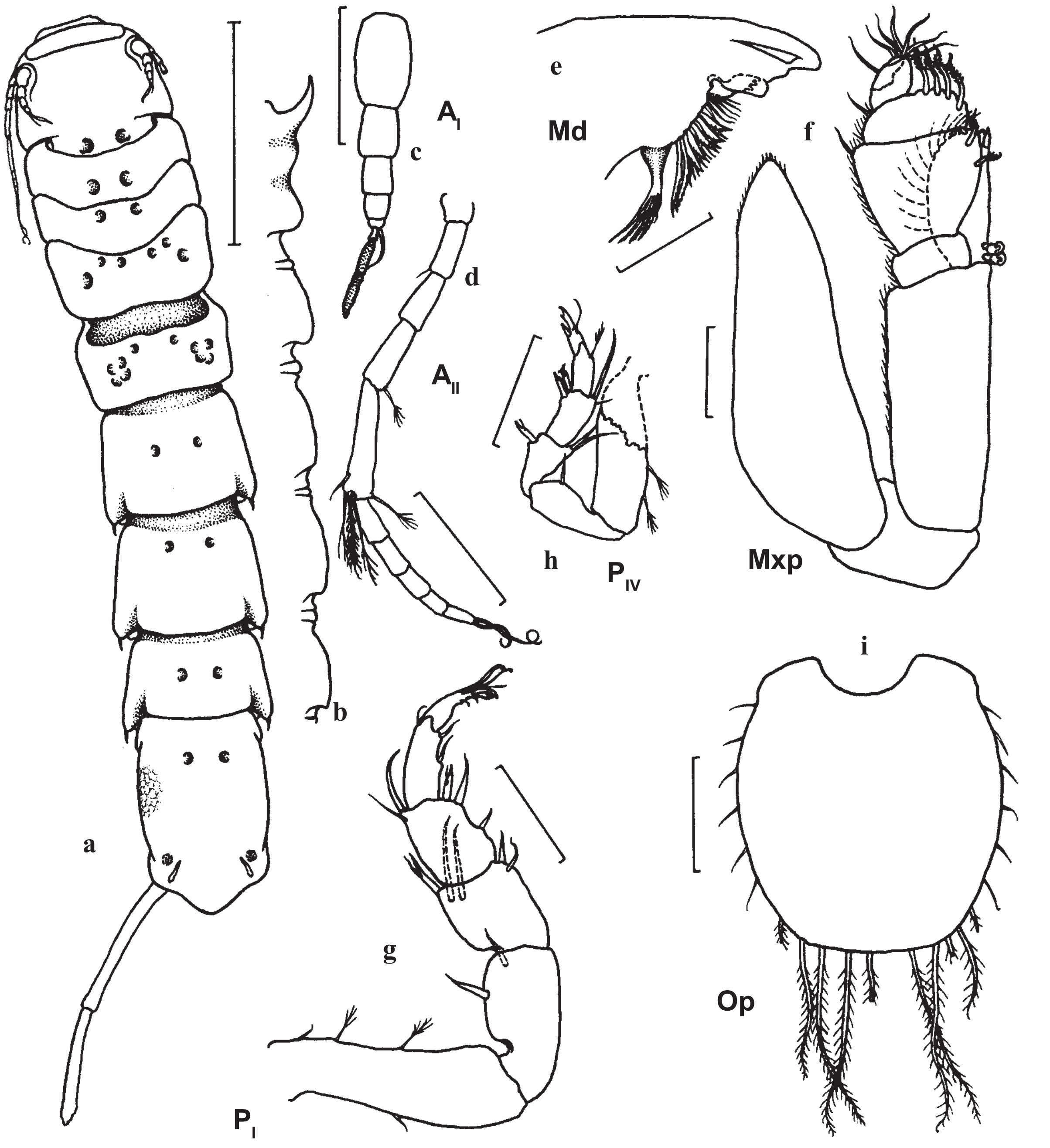


Fig. 3. *Macrostylis lacunosa* sp.n. Holotype female: total view from above (a), sternites from lateral side (b) and appendages (c–i). Scale bars: 0.5 mm (a, b), 0.05 mm (c–f) and 0.1 mm (g–i).

Рис. 3. *Macrostylis lacunosa* sp.n. Голотип самка: общий вид сверху (a), стерниты сбоку (b) и придатки (c–i). Масштаб 0,5 мм (a,b), 0,05 мм (c–f) и 0,1 мм (g–i).

Anterior division of pereon subrectangular, rounded antero- and posterolaterally, with almost parallel lateral surfaces, length equal to maximal width; tergites I–III approximately equal in length among themselves; sternal surface differentiated segmentally by shallow transversal grooves, with single large frontal spine.

Tergite IV insignificantly broadened frontally, length 2.5 times less than maximal width; sternite without spine.

Tergite V 1.1 times longer than tergite VI and 1.3 times longer than tergite VII; posterolateral parts of tergites V–VII visible tapered backwards everyone, with one distal bristle; sternites V–VII without spines.

Pleotelson oblong, pentagonal, with uniformly convex dorsal surface and weakly convex lateral surfaces; length 4.5 times less than total body length; maximal width 1.55 times less than length and 1.1 times more than width of distal part; posterolateral projections rounded; mediodistal lobe large, roundly angular; caudal organs visible distinctly, slot-like apertures diagonal.

Antenna I consists of 5 articles, length ratios from basal to distal: 1 : 0.50 : 0.40 : 0.25 : 0.10; distal article with one

aesthetasc of average length. Antenna II short and thin, 2.3 times longer than antenna I and reaching tergite II; flagellum consists of 5 articles; rudiment of exopodite one-articled.

Cutting margin of mandible with three teeth (anterior and posterior tooth roundly blunt distally; middle tooth like tubercle); movable plate with three roundly pointless denticles; tooth process narrow, conical, with 5 distal bristles. Epipodite of maxillipede without exterolateral excavation, length 3.1 times more than maximal width; fourth article of maxillipedal palp broadened outside as lobe, almost completely covering apical article.

Pereopods III not saved. Ischiopodite of pereopod IV with short, widely angular lobe.

Operculum short, tongue-like, maximal width equal to length and 1.8 times more than width of distal margin; distal margin almost direct (poorly convex), with 10 long pinnate bristles.

Uropods 1,25 times longer than pleotelson; endopodite 1.25 times shorter than protopodite.

TAXONOMIC REMARKS. Narrow oblong body, presence of pits on head, tergites and pleotelson, absence of setation on dorsal surface of segments, single sternal spine, short antenna II, elongated narrow tooth process of mandible, broadened fourth article of maxillipedal palp and short wide operculum — combination of these characters at *M. lacunosa* sp.n. distinguishes it from other species of genus.

ETYMOLOGY. From Latin *lacunosus* (foveate); refers to the peculiarity of cuticular macrosculpture.

DISTRIBUTION. Northern part of the Indian Ocean (2°03.2´S, 86°44´E).

ECOLOGY. Abyssal zone, depth 4706–4737 m; in clayey silt at the bottom temperature 1.0°C.

Reference

Mezhov B.V. 2000. Addition to the fauna of isopod crustacean genus *Macrostylis* G.O. Sars, 1864 (Crustacea: Isopoda: Macrostylidae) of the Atlantic and Arctic oceans, with description of three new Atlantic species // Arthropoda Selecta. Vol.9. No.2. P.69–83.